

LOCO User Manual

Version 12.1

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LOCO

Program to Factor and Combine ASAS Results

1. Introduction

The ASAS loadcase combination program LOCO is a post-processor which selects, factors and combines the stresses, forces and displacements from previous ASAS (or LOCO) analyses. A common usage of the program is where many complex loadcases on a structure can be synthesized from a small number of unit loadcases. The analyst need only prepare the data for, and run, the unit loadcases through ASAS and then use LOCO to produce the actual loadcases as and when required. Should the design loading change further use of LOCO enables the analyst to produce the new combinations without the need to prepare new basic data, or carry out a further ASAS run.

Conversely, there are occasions where many loadcases need to be investigated but not all are required to be printed. LOCO allows the analyst to perform this selection.

A particularly useful application of LOCO is the facility which allows the combination of stresses and displacements from two or more separate analyses. For example, a structure may have been run with additional loadcases or analyses, or run with the alternative boundary conditions modelling symmetric and anti-symmetric halves of the total structure. Similarly the program may combine the results from a number of components, possibly in different structures, so long as each accessed component is formed from the same master component.

In the ASAS program the option exists to save results files for post-processing. This option is also available in LOCO. The files produced by LOCO are identical in format to those from the parent program and hence any ASAS post-processing program may also be used with the files from LOCO. This even applies to LOCO itself as it is possible to factor and combine loadcases generated by LOCO in further runs of the same program. One use of this feature is in checking a structure against different code stress values. For example, under normal operating conditions a lower allowable stress will be set than under a rarely encountered emergency overload.

1.1. Program Description

The LOCO program operates on the files saved from one or more ASAS analyses and/or previous LOCO runs. These files are saved by adding the command `SAVE LOCO FILES` to the preliminary data. The files contain the stresses, forces and displacements together with information about the original runs necessary for post-processing procedures.

Results from one or more ASAS analyses may be selected, factored and combined providing that the structures (or components) under consideration are identical in terms of the nodes and elements. They may differ with regard to the suppressions and loadcases. It is important to note that each structure from which stresses and displacements are extracted must have been run as part of the same project using the same Project Name.

The user has a number of options in LOCO. He may choose to process and print either stresses or displacements, or both. Furthermore the ability to retain the requisite files for further post-processing by using a `SAVE` command or the `ASDS` options is available in a similar way to that available in ASAS.

LOCO requires ASAS style preliminary data which is described in Appendix A. The remaining data refer to the structure(s), component(s), original loadcases and factors necessary to generate each new loadcase. These data are all entered in a free format style and are described in Section 2.2.

The program reads and checks the data for completeness and consistency and opens the files from each preceding ASAS or LOCO run in turn. Data from these files is checked to ensure that the structures or components in the previous analyses are compatible in terms of nodes and elements. Provided that no errors have been detected, the program then combines and factors the previous stresses, forces and displacements to produce the new loadcases.

1.2. Applied Loads Combination

To carry out certain post-processing, for example BEAMST, it is necessary to know the details of the applied loads. LOCO therefore also combines the applied load data to be consistent with the new results.

1.3. Resultant Load Calculation

The resultant loads calculated in stage 1 of ASAS are also stored on file. These are accessed by LOCO during the data check so that resultants of the combined loadcases may be produced. The origin about which the moments are calculated may be defined by use of the GOTP command in the preliminary data. If no resultant loads are required the NORE option will suppress their calculation. If the NORE option was used in the ASAS run, LOCO will indicate that no input load resultants were available from the previous run.

1.4. Static and Dynamic Stress Combination

To enable the combination of stresses from static ASAS or LOCO runs with stresses from a RESPONSE dynamic analysis, the user must ensure that the user element numbers on both the runs are identical. Due to internal reordering of freedoms in the dynamic analysis, the system element order will not correspond, and therefore the combination must be based on the user element numbers. This can be achieved by use of the option BYUE on the OPTIONS command of the LOCO run. Only stresses and forces are processed when this option is selected and no factoring or combining of displacements is carried out.

1.5. Units

If units have been employed in the previous ASAS analysis it is possible to specify modified units for the results. The default units will be those utilised in the original analysis and, if this is satisfactory, no additional information is required in the LOCO run. Both displacement and stress results units may be modified by inclusion of a UNITS command in the preliminary data. See Section A.15 UNITS command.

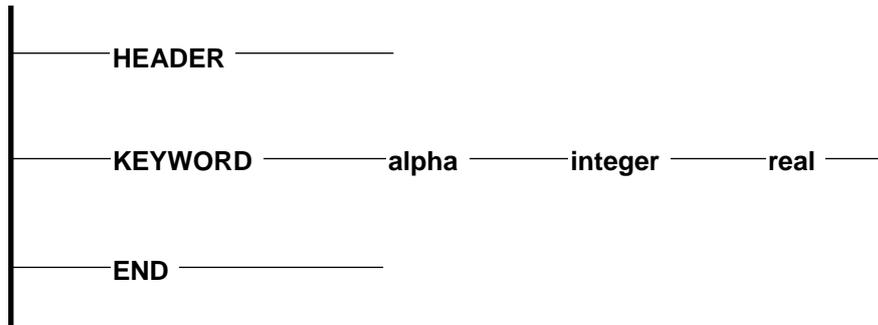
Note that if more than one structure/component is being combined in LOCO, the global analysis units must be consistent for all analyses being processed.

If units were not employed in the ASAS analysis the units will be assumed consistent for all structures/components being combined.

2. Data Formats

2.1. General Principles

The input data for LOCO are specified according to syntax diagrams similar to that shown below. The conventions adopted are described in the following pages.



Each data block commences with a compulsory header line and terminates with an **END** command which delimit this information from any other data. The sequence of the input data follows the vertical line down the left hand side of the page.

Within a data block, each horizontal branch represents a possible input instruction. Input instructions are composed of keywords (shown in upper-case), numerical values or alphanumerics (shown in lower-case characters), and special symbols. Each item in the list is separated from each other by a comma or one or more blank spaces.

An input line must not be longer than 80 characters.

Numerical values have to be given in one of two forms:

- (i) If an integer is required a decimal point must not be supplied.
- (ii) If a real is required the decimal point may be omitted if the value is a whole number.

Exponent formats may be utilised when real numbers are required.

For example 0.004 4.0E-3 4.0D-3 are equivalent

similarly 410.0 410 4.10E2 have the same value

Alphanumerics must begin with an alpha character (A-Z). The letters A-Z may be supplied in either upper or lower case but no distinction is made between the upper and lower case form. Hence “A” is assumed identical with “a”, “B” with “b” and so on.

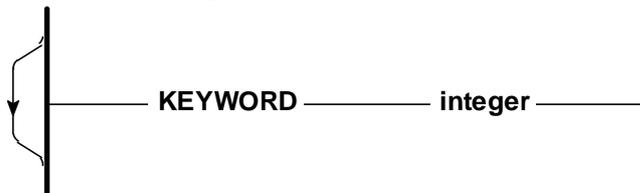
For example CASE are all permissible alphanumeric strings
 STR1
 END

also COMB are all identical strings
 Comb
 comb

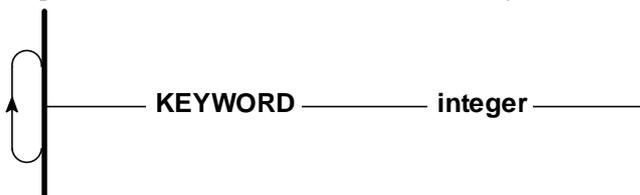
However 3BMD are examples of inadmissible alphanumeric strings
 5BL

Alphanumeric strings must not include any special symbols (see below)

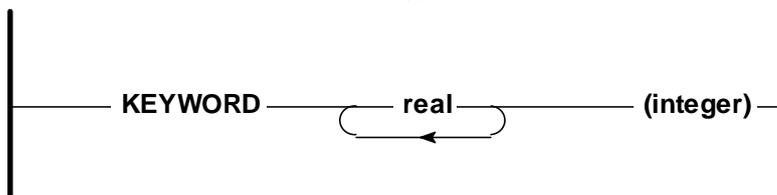
If certain lines are optional, these are shown by an arrow which bypasses the line(s)



In order to build up a block of data, a line or a series of lines may need to be repeated until the complete set has been defined. This is shown by an arrow which loops back.



Some data lines require an integer or real list to be input whose length is variable. This is shown by a horizontal arrow around the list variable(s).



A parameter enclosed in brackets is optional

2.1.1. Special Symbols

The following is a list of characters which have a special significance to the LOCO input.

- * An asterisk is used to define the beginning of a comment, whatever follows on the line will not be interpreted. It may appear anywhere on the line, any preceding data will be processed as normal. For example

```
* THIS IS A COMMENT FOR THE WHOLE LINE
case 4 2.7 * THIS IS A COMMENT FOR PART OF A LINE
```

- ' single quotes are used to enclose some text strings which could contain otherwise inadmissible characters. The quotes are placed at each end of the string. They may also be used to provide in-line comments between data items on a given line.

For example

```
STRUCTURE 'As used for design study' STRU
```

- ,
- A comma or one or more consecutive blanks will act as a delimiter between items in the line.

For example 5, 10, 15 is the same as 5 10 15

Note that two commas together signify that an item has been omitted. This may be permissible for certain data blocks.

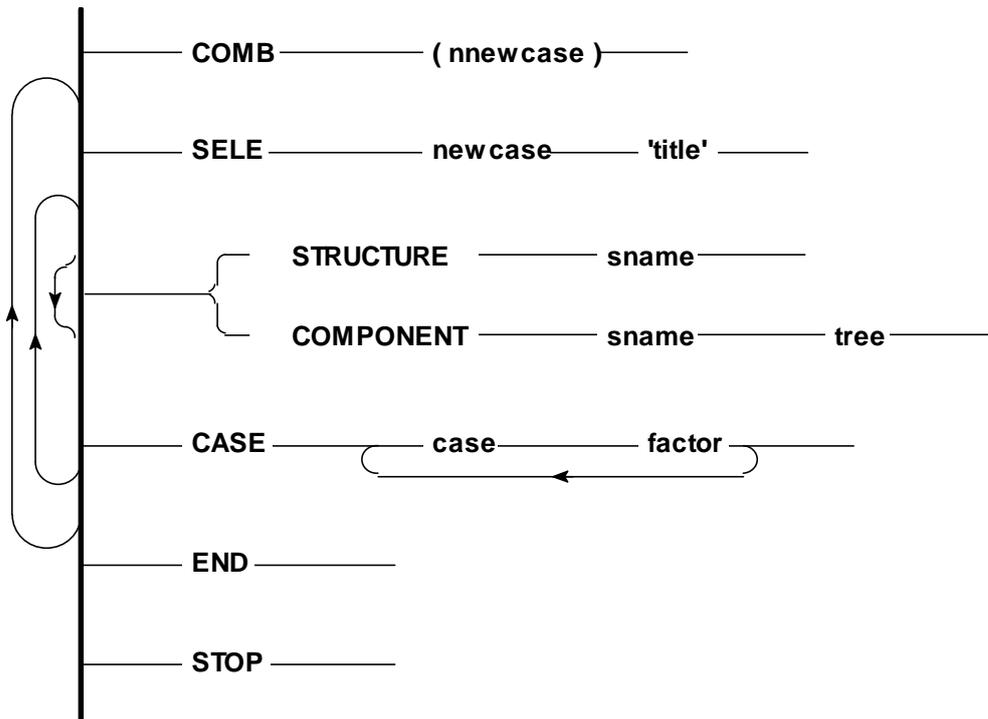
For example 5, , 15 is the same as 5 0 15

Unless otherwise stated in the section describing the data block, omitted numerical values are zero.

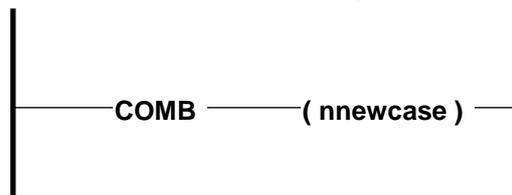
2.2. Load Combination Data

This data block defines the number of new loadcases to be generated, the constituent structures/loadcases that are to be combined and the factors to be applied. The general form of the data is shown below.

2.2.1. COMB - Combination Data Header



This command defines how many new loadcases are to be created in this LOCO run.



Parameters

- COMB** : compulsory header keyword which denotes the start of the load combination data.
- nnewcase** : number of new loadcases to be created in this analysis. Optional. (Integer). If supplied, **nnewcase** must equal the number of combined loadcases defined.

2.2.2. SELE - New Loadcase Command

The **SELE** command precedes a set of commands defining how each new loadcase is made up. It identifies the user's new loadcase number and title.



Parameters

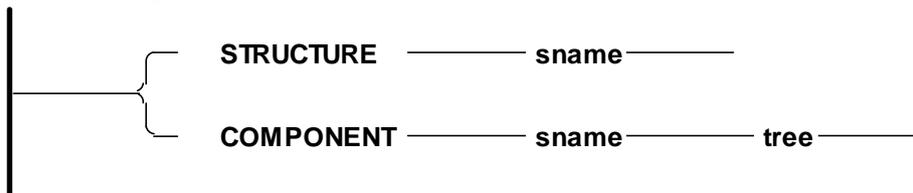
- SELE** : compulsory keyword to denote the start of a new loadcase.
- newcase** : user loadcase number for this new load. Every new loadcase number must be unique but need not form a sequence with the other new loadcase numbers and can be the same as a constituent **case** number, see Section 2.2.4. (Integer).
- 'title'** : loadcase title. (Alphanumeric string enclosed in single quotes, 40 characters)

Note

The total number of **SELE** commands must exactly equal the number of loadcases defined on the COMB command.

2.2.3. Structure/Component Redefinition Command

The constituent loadcase information may be drawn from more than one analysis. By default, the existing loadcase information is drawn from the structure/component defined in the PRELIMINARY data (see Sections A.8 and A.9). If existing loadcases are required from different analyses, the structure/component may be redefined within the load combination data.



Parameters

- STRUCTURE** : keyword to denote that loadcases from a different structure are to be utilised.
This command is used for non-substructured analyses.
- sname** : structure name identifying which existing structure is to be accessed from the project defined in the preliminary data for subsequent loadcases.
- COMPONENT** : keyword to denote that loads from a different component are to be utilised.
This command is only used for substructure analyses (but see below).

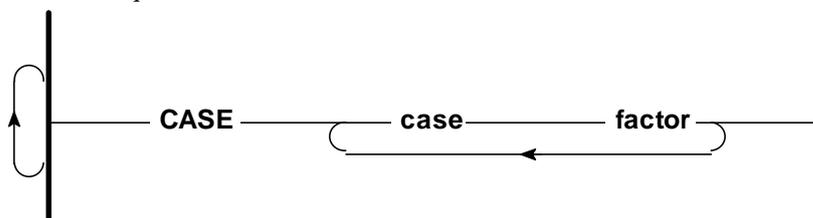
tree : this is the path down the component tree from the given structure in **sname** to the recovered component being used for the LOCO combinations. If processing a global structure run from a multilevel analysis and the component tree is not required, use the **STRUCTURE** command instead. See example, Section 3.4.

Notes

1. If results from more than one structure are being combined together and use is made of the **STRUCTURE** or **COMPONENT** commands, loadcase information is drawn from the currently defined structure or component until another **STRUCTURE** or **COMPONENT** command is defined. However for clarity in such cases it is recommended that a **STRUCTURE** or **COMPONENT** command should follow each **SELE** command and be inserted at other places in the data as necessary. See Example 2, Section 3.2
2. When LOCO is used to combine and factor results for a recovered component within a substructured analysis, only new results for that component are available. No results are available for higher level or lower level components on the same path and it is not possible to perform further Stress Recoveries from the new results.

2.2.4. CASE - Base Loadcase Selection Command

This command defines the constituent loadcase numbers from the existing analyses which are to be combined in the current new loadcase defined by the preceding **SELE** command. The loadcase can be factored if required.



Parameters

- CASE** : compulsory keyword to identify the command line.
- case** : existing user loadcase number relating to the last defined **STRUCTURE / COMPONENT** command (see Section 2.2.3). (Integer).
- factor** : factor by which the defined loadcase is to be multiplied before forming part of the new loadcase. This value **must** be supplied since there is no default. (Real).

Note

Several case commands may be used to build the list of constituent cases.

2.2.5. END Command

To terminate the combination data. Compulsory.

```
|  
|  
|-----END-----  
|
```

Parameters

END : compulsory keyword.

2.3. STOP Command

To define the end of the input data for this run. Compulsory.

```
|  
|  
|-----STOP-----  
|
```

Parameters

STOP : compulsory keyword

3. Examples

3.1. Example 1: Using LOCO for simple loadcase printing and combination

This example illustrates the usage of LOCO to select three loadcases from a previous ASAS run and to form a combined loadcase from two of these unit loadcases. Only one set of ASAS files is accessed.

The preliminary data for the original ASAS run was as follows:

```
SYSTEM DATA AREA 50000
PROJECT JACK
JOB NEW LINE
FILES JAC1
TITLE LANDING ANALYSES
OPTIONS GOON END
SAVE LOCO FILES
END
```

The Project Name for both the ASAS and LOCO runs is JACK. The four character backing file name of the ASAS run was JAC1. Note that in this instance (a single ASAS analysis) the STRUCTURE name was also given by the four character backing file identifier JAC1.

The LOCO data file is shown below. The LOCO preliminary data contains a STRUCTURE command to define from where the existing loadcases are to be taken. New files created by this run are identified by the prefix JAC2 as given in the FILES command. Since new results are being generated, a new structure is created, also called JAC2.

The files used in this run are required for further post-processing and hence a SAVE LOCO FILES command is included. No other options have been defined so both stresses and displacements will be combined and printed.

```

SYSTEM DATA AREA 35000
PROJECT JACK
JOB POST
FILES JAC2
TITLE AIRPLANE LANDING CASES - 31.10.92
STRUCTURE JAC1
NEWSTRUCTURE JAC2
OPTIONS END
SAVE LOCO FILES
END
COMB
* DEFINE UNIT LOAD CASES
SELE 1 AIRCRAFT DEADWEIGHT
CASE 1 1.0
SELE 2 BRAKING FORCES
CASE 2 1.0
SELE 3 EMERGENCY - TIRE BURST LOADING
CASE 3 1.0
* SET UP COMBINATION
SELE 7 DEADWEIGHT BRAKING AND EMERGENCY CONDITIONS
CASE 1 1.0 2 1.0 3 1.0
END
STOP

```

3.2. Example 2: Combination of Loadcases from Three Separate Analyses

This example takes three loadcases, one each from three separate non-substructured analyses, and combines them to form one new loadcase.

The preliminary data for the three ASAS runs were as follows:

```

SYSTEM DATA AREA 45000
PROJECT GHPJ
JOB NEW LINE
FILES GD02
TITLE FIRST STRUCTURE RUN
OPTIONS END
SAVE LOCO FILES
END

SYSTEM DATA AREA 45000
PROJECT GHPJ
JOB OLD LINE
FILES GD22
TITLE SECOND STRUCTURE RUN
OPTIONS GOON END
SAVE LOCO FILES
END

```

```
SYSTEM DATA AREA 45000
PROJECT GHPJ
JOB OLD LINE
FILES GD12
TITLE THIRD STRUCTURE RUN
OPTIONS END
SAVE LOCO FILES
END
```

All three structures are run under the same project name, GHPJ, and adopt the 4 character file names supplied in the FILES commands as the structure names viz GD01, GD22 and GD12.

The LOCO data is shown below. The initial structure to be accessed, GD02, is defined in the preliminary data and this by default would be used as the source for the loadcase information for the first CASE command. However a specific STRUCTURE command has been included following the first SELE command for clarity. Additional loadcases 23 and 11 are taken from structures GD22 and GD12 respectively.

As there is no SAVE command, no further post-processing will be possible, but the stresses and displacements will be printed.

```

SYSTEM DATA AREA 30000
PROJECT GHPJ
JOB POST
FILES LOC1
TITLE          LOCO COMBINATION OF RESULTS FROM 3 STRUCTURES
STRUCTURE      GDO2
NEWSTRUCTURE   LOC1
OPTIONS END
END
COMB
SELE 99          COMBINED LOADCASE
STRUCTURE GD02
CASE 4 1.0
* CHANGE TO SECOND STRUCTURE
STRUCTURE GD22
CASE 23 1.0
* NOW GET RESULTS FROM DG12
STRUCTURE GD12
CASE 11 1.0
END
STOP

```

Note that the above data file would also be appropriate for a multilevel substructure analysis where results from global structural assembly runs are being combined. For processing recovered components in a substructure analysis, see Example 3.4.

3.3. Example 3: Multiple Use of LOCO For Simple ASAS Analyses

This example illustrates the use of LOCO to process files of stress and displacement information from previous uses of LOCO itself.

3.3.1. Original LOCO Run

This run takes the files from an ASAS analysis, Project Name GD12 and previous backing file name GD12 (the user either gave the file name as GD12 or left it blank and hence it defaulted to the Project Name). A NEWSTRUCTURE called YZLO is being created and the files will be saved. One new loadcase is produced.

```

SYSTEM DATA AREA 32000
PROJECT GD12
JOB POST
FILE YZLO
TITLE                FIRST USAGE OF LOCO ON GD12 STRUCTURE
STRUCTURE GD12
NEWSTRUCTURE YZLO
OPTIONS END
SAVE LOCO FILES
END
COMB
SELE 7                COMBINATION OF CASES 5 AND 4
CASE      5          10.0
CASE      4           1.0
END
STOP
    
```

3.3.2. Second LOCO Run

This run combines the information from the original analysis (Project and File Names GD12) with the previous LOCO run (File Name YZLO). One new loadcase is generated drawing on the results so far. No further processing will be possible since no SAVE command has been specified.

```

SYSTEM DATA AREA 32000
PROJECT GD12
JOB POST
FILES ZZL1
TITLE                SUBSEQUENT USAGE OF LOCO ON GD12 + YZLO
STRUCTURE            GD12
NEWSTRUCTURE        ZZL1
OPTIONS END
END
COMB
SELE 99              NEW CASE PRODUCED
CASE      4          -1.0
STRUCTURE YZLO
CASE      7           1.0
END
STOP
    
```

3.4. Substructured Usage of LOCO

This example demonstrates the use of LOCO with the substructure facility. The stress and displacement values are drawn from component RHS2 of structure STRU and component RHLS of

structure STSL. Components RHS2 and RHLS both derive from the same master component CMP1 and, of course, all the structures and components have been run under the same project name - BHAA. Components BLVW and BRNP are intermediate components between the ones used here and their structures.

The creation of these components can be outlined as below:

Description	Component RHLS		Component RHS2	
	Component/ Structure ID	Assembled name	Component/ Structure ID	Assembled name
First Level Component Creation	CMP1			
Second level Component Creation	CMP2	RHLS	CMP3	RHS2
Global Structure	STSL	BRNP	STRU	BLVW
Component	STSL BRNP RHLS		STRU BLVW RHS2	

The initial component for the existing loadcase information is STRU BLVW RHS2 as defined in the preliminary data and this is used to extract information from CASE 2 for the new loadcase 27. The remaining CASE definitions are preceded by COMPONENT commands to alter the source of the load information. New files created will be identified by the name BHST.

Note that if further processing of this component is required, these results are identified by the component name STNW BLVW RHS2 i.e. the new structure name (STNW), together with the component tree defined in the preliminary data. (BLVW RHS2).

Results for the intermediate component, STNW BLVW would not be available for further processing. See Section A.10 NEWSTRUCTURE command.

```

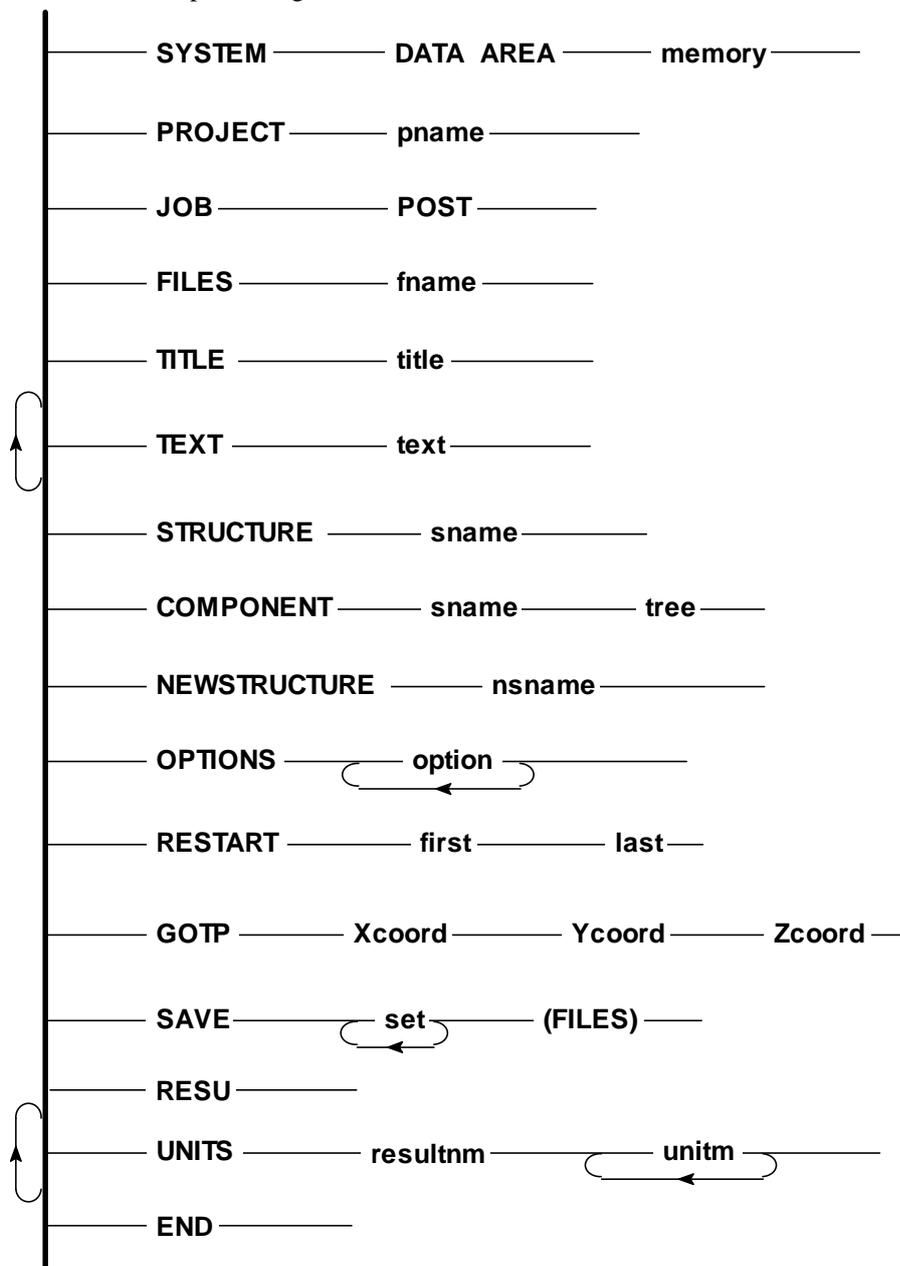
SYSTEM DATA AREA 35000
PROJECT BHAA
JOB POST
FILES BHST
TITLE          EXAMPLE OF COMPONENTS IN ASASLOCO
* INITIALLY USE COMPONENT RHS2 AS SOURCE OF LOAD INFORMATION
COMPONENT  STRU  BLVW  RHS2
NEWSTRUCTURE  STNW
OPTIONS  END
SAVE LOCO FILES
END
COMB
    
```

```
SELE 27          WIND GUST AND DEPRESSURIZATION
CASE 2          1.0
* EXTRACT LOAD INFORMATION FROM COMPONENT RHLS
COMPONENT STSL BRNP RHLS
CASE           5  -1.0
SELE 28  BANKING TURN AND WIND GUST
* GO BACK TO ORIGINAL COMPONENT RHS2
COMPONENT STRU BLVW RHS2
CASE 2          1.0
* RESET ACTIVE COMPONENT TO RHLS
COMPONENT STSL BRNP RHLS
CASE           7  1.42
END
STOP
```

Appendix - A Preliminary Data Block for LOCO

A.1 Introduction

The preliminary data is the first block of the LOCO data. It defines the memory size to be used, the project name, structure and component names, file names and options to be used. It also defines which files are to be saved for further processing.



The preliminary data must commence with the **SYSTEM** command and terminate with **END**. Within these bounds the other commands may be given in any order. It is suggested, however, that the order given above is adopted.

A.2 SYSTEM Command

To define the amount of memory used for data by this run. Optional.

```
|-----SYSTEM-----DATA AREA-----memory-----
```

Parameters

SYSTEM : keyword

DATA AREA : keyword

memory : amount of memory (in 4 byte words) to be used by this run. Typical values are between 30000 and 1000000. If the **SYSTEM** command is omitted, a default value of 1000000 is used (Integer).

Examples

```
SYSTEM DATA AREA 80000
```

A.3 PROJECT Command

To define the project name for the current run. Optional.

```
|-----PROJECT-----pname-----
```

Parameters

PROJECT : keyword

pname : project name for current run. (Alphanumeric, 4 characters, first character must be alphabetic)

Notes

All runs with the same project name access the same data base. A project data base consists of one project file (with a file name consisting of the 4 characters of **pname** with the number 10 appended) which acts as an index to other files created under this project, together with those other files.

Example

PROJECT HIJK

A.4 JOB Command

To define the type of analysis being performed. Compulsory.



Parameters

JOB : keyword

POST : keyword

Example

JOB POST

A.5 FILES Command

To define the prefix name for the backing files created in this run. Optional.



Parameters

FILES : keyword

fname : prefix name for any backing files created by this run. (Alphanumeric, 4 characters, first character must be alphabetic)

Notes

fname is used as a prefix for all files created during the current run. The four characters are appended with two digits in the range 12 to 35 to create each individual file.

Example

FILES BILL

A.6 TITLE Command

To define a title for this run. Recommended.



Parameters

TITLE : keyword

title : this line of text will be printed out at the top of each page of ASAS output. (Alphanumeric, up to 74 characters)

Example

TITLE THIS IS AN EXAMPLE OF A TITLE LINE

A.7 TEXT Command

To define a line of text to be printed once only at the beginning of the output. Several **TEXT** lines may be defined to give a fuller description of the current analysis on the printed output.



Parameters

TEXT : keyword

text : this line of text will be printed once, at the beginning of the output. (Alphanumeric, up to 75 characters)

Example

```
TEXT THIS EXAMPLE OF THE TEXT
TEXT COMMAND IS SPREAD
TEXT OVER THREE LINES
```

A.8 STRUCTURE Command

To define the name of an existing structure within the current project that is to be processed in this run.

```
|-----STRUCTURE-----sname-----
```

Parameters

STRUCTURE : keyword

sname : structure name identifying which existing structure is to be accessed from the project defined on the **PROJECT** command. (Alphanumeric, 4 characters, the first character must be alphabetic)

Notes

1. The loadcase information to be processed may be drawn from more than one structure and this is achieved by respecifying a **STRUCTURE** command within the **COMBination** data (see Section 2.2). The structure defined in the preliminary data is adopted until a new **STRUCTURE** command is encountered.
2. If section libraries have been utilised in any of the preceding analysis, information relating to the structure name defined in the preliminary data will be transferred for post processing.

See also A.9 **COMPONENT** command.

Example

```
STRUCTURE SHIP
```

A.9 COMPONENT Command

To define the component tree for a substructure combination run. Not valid for a non-substructured analysis.



Parameters

COMPONENT : keyword

sname : structure name as defined on the previous **STRUCTURE** command. (Alphanumeric, 4 characters, the first character must be alphabetic).

tree : this is the path down the component tree from the given structure in **sname** to the component which is being used for the LOCO stress and displacement combinations.

Notes

1. If the user is processing the global structure run in a substructure analysis, use only the **STRUCTURE** command (A.8).
2. The loadcase information to be processed may be drawn from more than one component and this is achieved by respecifying a **COMPONENT** command within the **COMB**ination data (see Section 2.2). The component defined in the preliminary data is adopted until a new **COMPONENT** command is encountered.
3. If section libraries have been utilised in any of the preceding analyses, information relating to the component name defined in the preliminary data will be transferred for post processing.

Example

```
COMPONENT SHIP PORT BULK
```

A.10 NEWSTRUCTURE Command

To define the new structure name to be associated with the results created by a restarted run. Required by restarted job only highly recommended.



Parameters

NEWSTRUCTURE : keyword

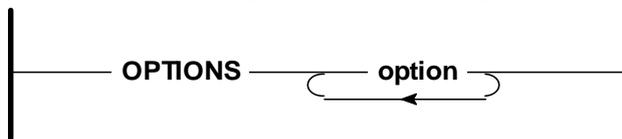
nsname : structure name to be associated with the results being created by the current restarted run in order to identify these results from others in the project. **nsname** must be unique for this project (Alphanumeric, 4 characters)

Note

- 1 If the NEWSTRUCTURE command is omitted then **nsname** defaults to the name ASNN. However, since the structure name must be unique within a project, the default must not be assumed more than once if the project contains a series of restarts.
- 2 A Structure command is normally required in conjunction with NEWSTRUCTURES to define the name of the existing structure.

A.11 OPTIONS Command

To define the control options for this run. Optional.



Parameters

OPTIONS : keyword

option : 4 character option name, or list of option names. See Appendix C for details of each option available.

Example

OPTIONS DATA GOON NODL

A.12 RESTART Command

To define the restart stages to be executed for this run. Optional.



Parameters

- RESTART** : keyword
- first** : number of the first restart stage to be computed by this run.
- last** : number of the last restart stage to be computed by this run.
Optional, if omitted, defaults to last valid stage for this run.

Note

All valid restart stages between **first** and **last** for the current analysis will be executed. Only valid restart stage numbers must be defined for **first** and **last**. The valid stage numbers are given in Appendix D.

Example

An example to request that the current run should execute all stages between data input (Stage 1) and element stress combination (Stage 4)

```
RESTART 1 4
```

A.13 GOTP Command

Defines the point about which the resultants of the loads are calculated. (The **Global OverTurning Point**).
Optional.



Parameters

- GOTP** : keyword

xcoord : The coordinates of the point about which the resultant moments of the applied loads are
ycoord calculated. (Real)
zcoord

Note

If the **GOTP** command is omitted then the global origin (0,0,0) is used to calculate the resultants.

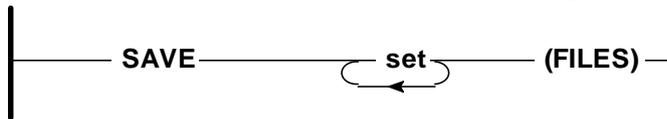
Example

```
GOTP 27.6 0.0 15.9
```

A.14 SAVE Command

To define which files or sets of files are to be saved for subsequent runs. Two types of files may be saved, those for further numeric processing and those for interfacing to graphical results display programs such as FEMVIEW.

A.14.1 Files for Numerical Processing



Parameters

SAVE : keyword

set : keywords to define the sets of files to be saved for use in subsequent processing runs.
 Permitted values are:

Name	Subsequent run/processing
LOCO	- for loadcase factoring using LOCO
STRE	- to postprocess element stresses and forces using POST and BEAMST

FILES : keyword

Notes

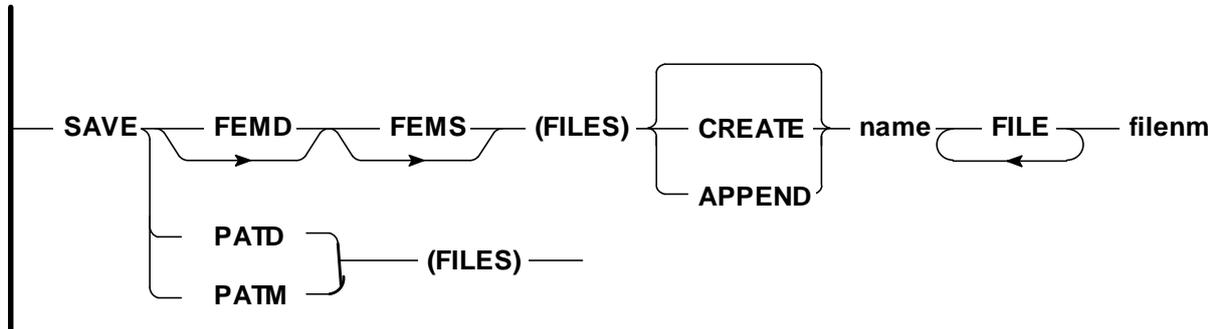
1. If several sets of files are to be saved they may be specified on one or several **SAVE** commands.
2. The **SAVE** command may be used to save explicit files. See ASAS User Manual for details.

Example

To save files necessary for further loadcase factoring and combining

SAVE LOCO FILES

A.14.2 Interface Files for Plotting Programs



SAVE : keyword

FEMD : keyword to denote displacements to be added to FEMVIEW file

FEMS : keyword to denote stresses to be added to FEMVIEW file

FILES : keyword. (Optional)

CREATE : keyword to indicate that model data must be added to FEMVIEW file

APPEND : keyword to indicate model data not to be added to FEMVIEW file

name : model name for FEMVIEW (defaults to structure name)

FILE : keyword to indicate file name follows

filenm : name of file to contain FEMVIEW data

PATD : keyword to denote displacements to be added to binary PATRAN file

PTDC : keyword to denote displacements to be added to ascii PATRAN file

Example

To save files necessary for viewing results in FEMVIEW

SAVE FEMD FEMS FILES APPEND TANKER FILE TANKER.FVI

A.15 RESU command

To specify saving of results. The factored and combined displacements and stresses will be saved.



Parameters

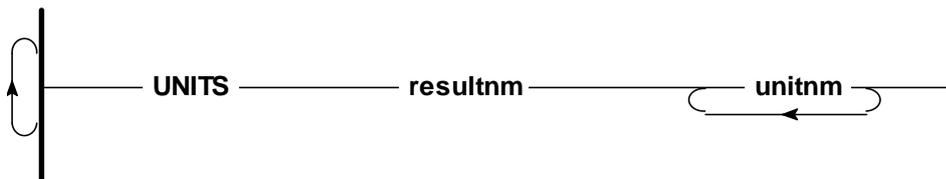
RESU : keyword

Example

RESU

A.16 UNITS Command

Allows redefinition of units for the printed results if UNITS have been employed in the original analysis. If this command is omitted and UNITS were employed in the original analyses, the printed results have the same units as the original results.



Parameters

UNITS : keyword

resultnm : identifier for results units to be modified. The following keywords are available.

- DISP - Displacement printing
- STRE - Stress or force printing

unitnm : name of unit to be utilised (see Notes below)

Notes

1. If the results from more than one structure or component are being combined, the analysis units for all the analyses must be identical.
2. For the results units, the angular term may be specified (default is radians). Valid names are:-

RADIAN(S), RAD(S)
DEGREE(S), DEG(S)

3. Only those terms which are required to be modified need to be specified, undefined terms will default to those given by the global units definition. For example, if the global units are N, M, then the command

UNITS STRE MM

will provide stresses in terms of N/MM²

4. Valid Unit Names

Length Unit	METRE(S)	M
	CENTIMETRES(S)	CM
	MILLIMETRE(S)	MM
	MICROMETRE(S)	MICM
	NANOMETRE(S)	NANM
	FOOT, FEET	FT
	INCH, INCHES	IN
Force	NEWTON(S)	N
	KILONEWTON(S)	KN
	MEGANEWTON(S)	MN
	TONNEFORCE(S)	TNEF
	POUNDAL(S)	PDL
	POUNDFORCE,	LBF
	KIP(S)	KIP
	TONFORCE(S)	TONF
	KGFORCE(S)	KGF

Example

The global analysis units are N and M, but the displacements are to be printed in mm and the stresses in KN/mm².

```
UNITS  DISP  MM
UNITS  STRE  KN  MILLIMETRES
```

Note that the reactions printed in the displacement report will be in Newtons and millimetres.

A.17 END Command

To terminate the preliminary data. Compulsory.

```
|
|-----END-----
```

Parameters

END : compulsory keyword

Appendix - B Running LOCO

B.1 ASAS Files Required by LOCO

LOCO operates on the files produced by the preceding ASAS analyses and/or LOCO runs and hence these must physically be present in the user's disc space for the program to run successfully. In all cases the project file must exist which contains information about all other files in the current set of analyses. The name of this file is derived from the four character Project Name defined on all the PROJECT commands in the set. (For example, if the Project Name is PRKZ, then the Project File will be PRKZIO).

For each ASAS, RESPONSE and LOCO analysis preceding this run with a 'SAVE LOCO FILES' command in its preliminary data block, there will be a physical file containing the stress and displacement information from that analysis. Again the physical file names are derived from the four character name defined on the FILES command. Typically, if the names used were STVK, SQSY and TBSS then the physical files would be STVK35, SQSY35 and TBSS35. The information stored in each file will depend on the form of the run producing the output. The stresses and displacements may relate to the analysis of a structure or to the results associated with the nodes and elements at any level in a substructured analysis. Provided that the user has the requisite files on disc the program will handle them in a transparent manner.

Each of the preceding analyses must have run to completion. If any preceding run did not complete either because of a failure or because the user terminated the run deliberately with a RESTART command, LOCO may error because some files may not exist.

B.2 Saving Files Produced by LOCO

LOCO uses files in the same way as ASAS, and a new physical file of the factored and combined stresses and displacements will be produced. This file will be name YYYY35, where YYYY is the four character name on the FILES command in the LOCO preliminary data. This physical file may be saved (and hence used for further post-processing) by including a SAVE command in the preliminary data of the LOCO run. If this command is absent then the file will not be saved. In addition, the new results will be saved to a file called YYYY45 by including a RESU command in the preliminary data. Note that LOCO does not delete any of the ASAS files used as these may be required for other post-processing.

B.3 Running Instructions for LOCO

See the appendices in the ASAS User Manual, Volume 1, for details on how to run any of the programs in the ASAS suite.

Appendix - C Options

This appendix describes the user options available in LOCO.

User options are specified on the OPTIONS command line in the preliminary data as a series of 4 character abbreviations. Many analyses can be performed without the user selecting any options. If the user wishes to select what processing or printing is required, the appropriate options can be supplied as listed below.

C.1 Miscellaneous Options

Option Name	Application
NOBL	Do not print the LOCO title page

C.2 Options to Control the Course of the Program

Option Name	Application
DATA	Stop after checking the data. This can be used to check the the load resultants before proceeding on to the combinations. If the data check produces no error or warning messages the restart stage 1 files will be saved. A subsequent run can be submitted containing only the original preliminary data together with a restart command to start at stage 2. (See Appendix D).
GOON	Proceed even after printed WARNINGS. This option allows the program to continue despite doubtful data. It should be used after a run in which the WARNINGS have been noted and rejected.
PPDS	Process displacements only.
PPST	Process forces/stresses only
BYUE	Combine element stresses using the user element numbers. This enables results from a static analysis to be combined with the results from RESPONSE. Note that displacements are not processed with this option.
NORE	No calculation of load resultant in the data check.

If neither PPDS nor PPST appear then both displacements and stresses will be combined and factored.

C.3 Options to Control the Printing and Saving of Information

If NODI and NOST are both specified then no results will be printed. By using a SAVE command, the combinations may be saved for further post-processing.

Option Name	Application
PRNO	Suppress printing of the input data
NODI	Do not print reactions and displacements
NOST	Do not print the stresses
BYEL	Stresses are printed in the order of all loadcases for each element instead of the default all elements for each loadcase
STRN	Print strains instead of stresses (element types TCS6, TCS8 and QUS4 only).

Appendix - D Restarts

LOCO, like ASAS, has a facility whereby any run is broken down into a series of separate stages. At the end of each stage the backing files are left in a condition such that, if necessary, the run can be restarted at that point. Each of these stages is known, therefore, as a Restart Stage.

For each restart stage, LOCO prints messages:

```
RESTART STAGE n STARTED
RESTART STAGE n COMPLETED
```

If for any reason a run fails to complete due to lack of time, disk storage, system failure, etc it is not necessary to restart from the beginning of the run. It is only necessary to restart at the stage which it was executing when the failure occurred.

This feature may also be used directly to break down a long analysis into a series of shorter steps by selecting the stages at which the run is to start and stop.

To restart a job, it is necessary to include a RESTART command in the preliminary data to identify the start and finish stages, see section A.12. A restart run only needs a preliminary data block (unless the first stage defined is stage 1), the combination data may be omitted. All of the original preliminary data must be present with the addition of the RESTART command. The TITLE may be changed if required.

The valid restart stages are as follows:

Stage No.	Description
1	Data input and checking
2	Combine displacements
3	Print displacements
4	Combine forces and stresses
5	Print forces and stresses

Note that all stages should be processed even though not all results are required. If the analysis does not run to completion, further post processing may be not be possible.